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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/521,389

03/08/00

OKAMOTO

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EXAMINER
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MM92/0208

EATON, K	ART UNIT	PAPER NUMBER
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2823

DATE MAILED:

02/08/01

PATRICK G BURNS  
GREER BURNS & CRAIN LTD  
SUITE 8660 - SEARS TOWER  
233 WACKER DRIVE  
CHICAGO IL 60606

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

**Office Action Summary**

Application N .

09/521,389

Applicant(s)

OKAMOTO, SHIGERU

Examiner

Kurt M. Eaton

Art Unit

2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11 December 2000.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-8, 10, 12-16 and 31-37 is/are pending in the application.
- 4a) Of the above claim(s) 8, 10, 12-16 and 31-37 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claims \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. § 119**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 08/959,763.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

**Attachment(s)**

- 15) ☐ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 18) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other:

## DETAILED ACTION

### *Election/Restrictions*

1. Applicant's election without traverse of Group I (claims 1-7) in Paper No. 5 is acknowledged.
2. Claims 8, 10, 12-16 and 31-37 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 5.

### *Priority*

3. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in parent Application No. 08/959,763, filed on 10/29/97.

### *Specification*

4. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

### *Claim Rejections - 35 USC § 102*

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1 and 3-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Nishida.

In re claim 1, Nishida shows in Figures 3(A)-3(F) an embedded electroconductive layer including an opening part or depressed part (14) formed in an insulating film (12) on a substrate (11); a barrier layer (16/16') covering the opening part or depressed part; a metal growth promoting layer (17) on the barrier layer; and an electroconductive layer (18) embedded in the opening part or the depressed part via the barrier layer and the metal growth promoting layer {column 4, line 3 - column 6, line 58}.

In re claim 3, Nishida shows wherein the metal growth promoting layer is a TiN layer containing oxygen at a lower concentration than the barrier layer {column 4, line 3 - column 6, line 58}.

In re claim 4, Nishida shows wherein the embedded electroconductive layer is a Cu layer, an Al layer, or an Al alloy having Al as a main component thereof {column 5, line 60 - column 6, line 58}.

In re claim 5, Nishida shows in Figures 3(A)-3(F) an embedded electroconductive layer including an opening part or depressed part (14) formed in an insulating film (12) on a substrate (11); a ground layer ((16/16')/17) containing oxygen at a high concentration in the lower part thereof and at a low concentration in the upper part thereof and covering the surface of the insulating film in the opening part of the depressed part; and an electroconductive layer (18) embedded in the opening part or the depressed part via the ground layer {column 4, line 3 - column 6, line 58}.

In re claim 6, Nishida shows wherein the ground layer is a TiN layer {column 4, line 3 - column 6, line 58}.

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In re claim 7, Nishida shows wherein the embedded electroconductive layer is a Cu layer, an Al layer, or an Al alloy having Al as a main component thereof {column 5, line 60 - column 6, line 58}.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nishida in view of Chiang et al..

In re claim 2, Nishida teaches wherein the barrier layer is one member selected from the group of TiN or TiW layers but could include other suitable materials {column 5, lines 22-32}.

Nishida fails to disclose wherein the barrier layer is one member selected from the group of amorphous Ti-Si-N,  $WN_x$ ,  $TaN_x$ , and  $Al_2O_3$  layers.

Chiang et al. (herein referred to as Chiang) teaches, in an analogous art related to the field of semiconductor devices, that suitable equivalent materials to TiN and TiW for use as barrier layer materials include materials selected from the group of amorphous Ti-Si-N,  $WN_x$ ,  $TaN_x$ , and  $Al_2O_3$  layers {column 13, lines 56-61}.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the barrier layer of Nishida out of a material selected from the group of amorphous Ti-Si-N,  $WN_x$ ,  $TaN_x$ , and  $Al_2O_3$ , as suggested by Chiang since the use of a known material on the

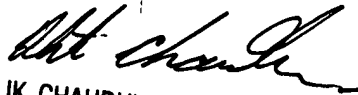
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basis of its suitability for the intended use involves only routine skill in the art. Furthermore, the specification contains no disclosure of either the critical nature of the claimed materials or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen materials or upon another variable recited in a claim, the applicant must show that the particular materials are critical.

***Conclusion***

9. Paper related to this application may be submitted directly to Art Unit 2823 by facsimile transmission. Papers should be faxed to Art Unit 2823 via the Art Unit 2823 Fax Center located in Crystal Plaza 4, room 4C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The Art Unit 2823 Fax Center number is **(703) 308-7722** or **-7724**. The Art Unit 2823 Fax Center is to be used only for papers related to Art Unit 2823 applications.

Any inquiry concerning this communication or earlier communication from the examiner should be directed to **Kurt Eaton** at **(703) 305-0383** and between the hours of 8:00 AM to 4:00 PM (Eastern Standard Time) Monday through Friday or by e-mail via [kurt.eaton@uspto.gov](mailto:kurt.eaton@uspto.gov).

  
OLIK CHAUDHURI  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800